asserts that it would have been obvious to replace the transfer function "imparted" in Minami with the head related features or functions of Suzuki, Cooper or Tanaka. To establish a prima facie case of obviousness there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Claim 1 recites a conference station comprising right and left spatially disposed microphones connected to a communication channel for receiving right and left audio signals, **wherein the differences between the right and left audio signals represent a head-related transfer function**". According to claim 1, the differences between the right and left audio signals represent a head-related transfer function. Applicants point out that there is no motivation to modify the Minami reference or to combine the teachings of cited references. In fact, it is improper to combine references where the references teach away from their combination. In re Grasselli, 713 F.2d 731, 743, 218 USPQ 769, 779 (Fed. Cir. 1983). Adding a head related transfer function to the Minami reference will destroy the intended use of the reference *i.e.*, reducing the cost of transmitting a stereo voice signal across a telephone line.

Minami discloses an apparatus where "stereo voice transmission is performed in the multiple simultaneous utterance mode, and **monaural voice transmission is performed in a single utterance mode**." Minami is transmitting a single utterance as a monaural voice signal and is transmitting multiple simultaneous utterances as a coded stereo voice transmission to realize a high band compression ratio. Minami utilizes a transfer function $G(\omega)$ in the single utterance mode to allow a single signal to be transmitted for a stereo signal. The single signal is transmitted along with the phase and the gain of the transfer function. The phase and the gain are used to reproduce the original stereo signal, *i.e.*,. the transfer function has not altered the original signal. The Office Action states that the transfer function "imparted" by Minami may not be disclosed as a head-related transfer function. However, Applicants point out that the transfer function in Minami does not "impart" anything to the transmitted signal. In the Minami reference, a single voice signal is transmitted for a recorded stereo signal, and the transfer function is used once the signal is received to reproduce the originally recorded signals for the listener. The transfer function **does not "impart" any spatial components** on the voice signal. In fact, the Minami reference "teaches away" from adding a head related transfer function. The intended use of Minami, *i.e.*, reducing the cost of transmitting a stereo voice signal across a

telephone line by reducing the bandwidth, is contrary to imparting a head related transfer function. Adding a head related transfer function to the Minami reference would be counter productive. Therefore, the combination of the cited references does not teach or suggest that **the differences between the right and left audio signals represent a head-related transfer function**. Applicants respectfully request that the examiner reconsider the combination of references asserted against the claim and withdraw the rejection under 35 U.S.C. § 103.

Claims 2-12 depend directly or indirectly from claim 1 and, as such, include the limitations thereof. Applicants submit that the differences between what is set forth in claims 2-12 including the limitations of claim 1 from which they depend, are such that they would not have been obvious to those of ordinary skill in the art in view of the cited references. Withdrawal of the rejection under 35 U.S.C. § 103 is respectfully requested.

Claim 13 recites converting audio information into right and left audio signals at a conference station, wherein the **conversion imparts** a differential characteristic to the right and left audio signals, and the **differential characteristic is represented by a head-related transfer function**, and the right and left audio signals comprise spatialized audio and **transmitting audio information representative of said spatialized audio from the conference station across a communication channel to a remote station**. As stated above, the transfer function of Minami **does not "impart" any spatial components** on the voice signal. In fact, adding a head related transfer function to the Minami reference is contrary to Minami's intended use, *i.e.*, reducing the cost of transmitting a stereo voice signal across a telephone line by reducing the bandwidth. Adding a head related transfer function to the Minami reference would be counter productive. Therefore, the combination of the cited references does not teach or suggest converting audio information into right and left audio signals at a conference station, wherein the **conversion imparts a differential characteristic that represents a head-related transfer function**. Applicants respectfully request that the examiner reconsider the combination of references asserted against the claim and withdraw the rejection under 35 U.S.C. § 103.

Claim 14 depends directly from claim 13 and, as such, includes the limitations thereof. Applicants submit that the differences between what is set forth in claim 14 including the limitations of claim 13 from which it depends, is such that it would not have been obvious to

those of ordinary skill in the art in view of the cited references. Withdrawal of the rejection under 35 U.S.C. § 103 is respectfully requested.

Claim 15 recites a **head-related transfer function unit connected to the communications system for imparting a head-related transfer function** to the audio signal **to produce a spatialized audio signal**". As stated above, the transfer function of Minami **does not "impart" any spatial components** on the voice signal. In fact, adding a head related transfer function to the Minami reference is contrary to Minami's intended use, *i.e.*, reducing the cost of transmitting a stereo voice signal across a telephone line by reducing the bandwidth. Adding a head related transfer function to the Minami reference would be counter productive. Therefore, the combination of the cited references does not teach or suggest a **head-related transfer function unit connected to the communications system for imparting a head-related transfer function** to the audio signal **to produce a spatialized audio signal**. Applicants respectfully request that the examiner reconsider the combination of references asserted against the claim and withdraw the rejection under 35 U.S.C. § 103.

Claims 16-18 depend directly from claim 15 and, as such, include the limitations thereof. Applicants submit that the differences between what is set forth in claims 16-18 including the limitations of claim 15 from which they depend, are such that they would not have been obvious to those of ordinary skill in the art in view of the cited references. Withdrawal of the rejection under 35 U.S.C. § 103 is respectfully requested.

Claim 19 recites transmitting the audio signal from the **transmitting station to a spatial sound conference bridge and imparting a head-related transfer function to the audio signal to create a spatialized audio signal** and sending the spatialized audio signal from the spatial sound conference bridge to a receiving station. As stated above, the transfer function of Minami **does not "impart" any spatial components** on the voice signal. In fact, adding a head related transfer function to the Minami reference is contrary to Minami's intended use, *i.e.*, reducing the cost of transmitting a stereo voice signal across a telephone line by reducing the bandwidth. Adding a head related transfer function to the Minami reference would be counter productive. Therefore, the combination of the cited references does not teach or suggest transmitting an audio signal from the **transmitting station to a spatial sound conference bridge and imparting a head-related transfer function to the audio signal** to create a spatialized audio signal.

Applicants respectfully request that the examiner reconsider the combination of references asserted against the claim and withdraw the rejection under 35 U.S.C. § 103.

Claims 20 and 21 depend directly from claim 19 and, as such, include the limitations thereof. Applicants submit that the differences between what is set forth in claims 20 and 21 including the limitations of claim 19 from which they depend, are such that they would not have been obvious to those of ordinary skill in the art in view of the cited references. Withdrawal of the rejection under 35 U.S.C. § 103 is respectfully requested.

Claim 22 recites a method for **conducting a spatial sound conference** comprising the steps of receiving an audio signal at a transmitting station, transmitting the audio signal from the transmitting station to a receiving station, **imparting a head-related transfer function to the audio signal to create spatialized audio signal**, and playing the spatialized audio signal on spatially disposed loudspeakers in the receiving station. As stated above, the transfer function of Minami **does not "impart" any spatial components** on the voice signal. In fact, adding a head related transfer function to the Minami reference is contrary to Minami's intended use, *i.e.*, reducing the cost of transmitting a stereo voice signal across a telephone line by reducing the bandwidth. Adding a head related transfer function to the Minami reference would be counter productive. Therefore, the combination of the cited references does not teach or suggest a method for **conducting a spatial sound conference** that **imparts a head-related transfer function to the audio signal to create spatialized audio signal**. Applicants respectfully request that the examiner reconsider the combination of references asserted against the claim and withdraw the rejection under 35 U.S.C. § 103.

Claim 23 depends directly from claim 22 and, as such, includes the limitations thereof. Applicants submit that the differences between what is set forth in claim 23 including the limitations of claim 22 from which it depends, is such that it would not have been obvious to those of ordinary skill in the art in view of the cited references. Withdrawal of the rejection under 35 U.S.C. § 103 is respectfully requested.

Claim 24 recites **a spatial sound conference bridge** comprising at least two input ports for receiving at least two audio signals and at least two audio signal output ports, a head-related transfer function unit connected to at least of said input ports for **imparting a head-related transfer function** to a corresponding audio signal **to produce at least one spatialized audio**

signal, and at least two output ports connected to the head-related transfer function unit for transmitting the spatialized audio signal. As stated above, the transfer function of Minami **does not "impart" any spatial components** on the voice signal. In fact, adding a head related transfer function to the Minami reference is contrary to Minami's intended use, *i.e.*, reducing the cost of transmitting a stereo voice signal across a telephone line by reducing the bandwidth. Adding a head related transfer function to the Minami reference would be counter productive. Therefore, the combination of the cited references does not teach or suggest **a spatial sound conference bridge that imparts a head-related transfer function** to at least one received audio signal **to produce at least one spatialized audio signal**. Applicants respectfully request that the examiner reconsider the combination of references asserted against the claim and withdraw the rejection under 35 U.S.C. § 103.

Claims 25 and 26 depend directly or indirectly from claim 24 and, as such, include the limitations thereof. Applicants submit that the differences between what is set forth in claims 25 and 26 including the limitations of claim 24 from which they depend, are such that they would not have been obvious to those of ordinary skill in the art in view of the cited references. Withdrawal of the rejection under 35 U.S.C. § 103 is respectfully requested.

Claim 27 recites a method for conducting **a spatial sound conference** comprising the steps of receiving at least two monaural audio signals, **generating at least two sets of spatialized audio signals** from the at least two monaural audio signals **using at least two head-related transfer functions**, compiling at least one composite signal from the at least two sets of spatialized audio signals, transmitting at least one composite signal to a location, and playing at least one composite signal at the location. As stated above, the transfer function of Minami **does not "impart" any spatial components** on the voice signal. In fact, adding a head related transfer function to the Minami reference is contrary to Minami's intended use, *i.e.*, reducing the cost of transmitting a stereo voice signal across a telephone line by reducing the bandwidth. Adding a head related transfer function to the Minami reference would be counter productive. Therefore, the combination of the cited references does not teach or suggest **generating at least two sets of spatialized audio signals** from the at least two monaural audio signals **using at least two head-related transfer functions**. Applicants respectfully request that the examiner

the examiner reconsider the combination of references asserted against the claim and withdraw the rejection under 35 U.S.C. § 103.

CONCLUSION

This application is in condition for allowance, and early notice of same is earnestly solicited. Should the examiner have any questions, comments or suggestions in furtherance of the prosecution of this application, he is invited to contact applicants' representative by telephone at the number indicated below.

Respectfully submitted,

Date: 9 April 99

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